A case of cutaneous metastatic breast cancer

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CASE

A woman, aged 73 years, presents concerned about the appearance of a new lesion on her right lateral lower back. This large erythematous nodular lesion has been present for at least a month and is asymptomatic. The lesion appears as shown in Figure 1.

QUESTION 1

Describe the clinical and dermoscopic features of the lesion and nominate your preferred differential diagnosis.

QUESTION 2

What further history would you like to elicit from the patient?

ANSWER 1

Figure 1 shows a nodular erythematous lesion on the patient's right lateral lower back. Close examination and dermoscopy reveal branching vessels of uniform calibre and no pigmentation over the area.

Relevant differential diagnoses and important clinical and dermoscopic findings relevant to each diagnosis are listed in Table 1.

ANSWER 2

Key further features on history would include:

- associated local symptoms, including pain, itching, burning, bleeding and discharge
- constitutional symptoms
- past medical history, including previous skin malignancies, history of internal malignancy, ultraviolet (UV) radiation exposure and immunosuppression
- personal or family history of skin malignancy or systemic malignancies
- social history, including occupation and recreational pursuits.[1]

CASE CONTINUED

On further history, the patient denies any local symptoms related to the lesion. She reports minimal UV sun exposure in her lifetime. Her past medical history is significant for breast cancer (invasive ductal carcinoma; oestrogen receptor [ER] positive, progesterone receptor [PR] positive, human epidermal growth factor receptor 2 [HER2] negative), first diagnosed 27 years previously, with recurrence and progression to metastatic disease in 2011. Coincidentally,

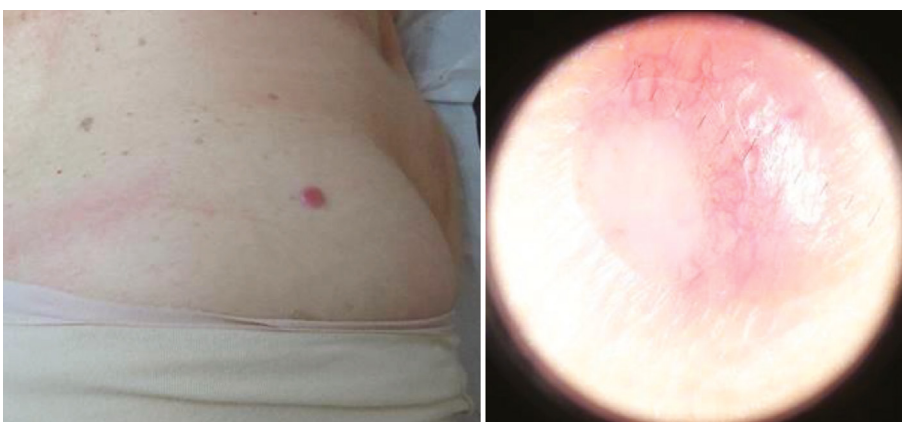

Figure 1. Right lower back lesion.

the patient reports that her cancer antigen 15-3 (CA15-3) tumour marker is rising despite no radiological evidence of disease progression.

The patient has no personal or family history of melanoma and no history of non-melanoma skin cancer.

QUESTION 3

How can this diagnosis be confirmed?

ANSWER 3

The diagnosis is readily confirmed with histopathology. Because this lesion is small, a complete excision can be performed. The defect can be closed primarily. A partial biopsy into fat could be considered for a lesion too large to excise and close directly.

CASE CONTINUED

Histopathological examination reveals a dermal nodular deposit of adenocarcinoma. The dermal deposit is not connected to the epidermis, indicating that the dermal tumour is likely to be of primary dermal origin, or a cutaneous metastatic deposit, and not epidermal in origin (Figure 2). Lymphovascular and perineural invasion is not identified. Excision margins are clear. This is considered to represent a cutaneous metastatic deposit of the patient's known metastatic breast cancer.

QUESTION 4

What are the most common tumour types to metastasise to skin?

ANSWER 4

Cutaneous metastases are rare, accounting for only 1–10% of all metastatic cancer.[1,6] They can be haematogenous or lymphatic metastases. In women, the most common tumour types to metastasise to the skin are breast carcinoma (70%), melanoma (12%) and ovarian cancer (3%). This differs from men, in whom cutaneous metastases typically originate from melanoma (32%), squamous cell carcinoma of the head and neck (16%), lung (12%) and colonic (11%) primary malignancies.[1] Cutaneous metastases are generally associated with a poor prognosis.[1,6] The age of an individual is also a significant factor determining the frequency of skin metastasis in certain primary cancers. In women of all ages, breast cancer is the most common internal cancer that causes skin metastasis, followed by colon and ovarian cancer.[8]

Typically, cutaneous metastases appear within several years of diagnosis of the primary malignancy. Rarely, as in the present case, they can arise well over a decade after the initial diagnosis. Breast cancer and melanoma are notorious for metastasis many years after diagnosis and treatment.[9] In 0.8–10% of cases, cutaneous metastases are the first sign of internal malignancies. Breast cancers are mostly adenocarcinomas of either ductal origin (invasive ductal cancer) or lobular origin (invasive lobular cancer).

Table 1. Differential diagnosis of nodular lesions and their clinical features

Differential diagnosis	Distinguishing clinical features	Dermoscopic characteristics
Basal cell carcinoma	• Associated with sun exposure • Commonly occurs on head and neck • Predisposing factors include male sex, fair skin, age >50 years, prior history of skin cancer, exposure to ionising radiation or arsenic, immunosuppression	• Absence of pigment network • In-focus linear and arborising telangiectasia • Focal ulceration[1,2]
Merkel cell carcinoma	• Asymptomatic, rapidly growing solitary pink, red or violaceous nodule • Commonly on head and neck • Key risk factors include sun exposure, immunosuppression (solid organ transplants, HIV, haematological malignancy) and ultraviolet radiation[3]	• Linear irregular and polymorphous vascular pattern • Poorly focused vessels • Milky pink and white areas with absence of pigmented structures[4]
Amelanotic melanoma	• Skin-coloured, pink or red nodule with little or no pigment • Key risk factors include increasing age and sun exposure	• Polymorphous vascular patterns including dotted, point and linear–irregular vessels • Milky red globules • Irregular or no pigmentation[5]
Cutaneous metastasis	• Firm, painless and erythematous nodule or an eruption of multiple skin nodules • Varies from being skin-coloured, pink, red–brown to blue–black or ulcerated[1,6] • Personal history of previous malignancy or lesion in same geographic region as initial carcinoma	• Vascular structures including serpentine, arborising and dotted comma-shaped vessels
Cutaneous B-cell lymphoma	• Solitary or multiple papules, plaques or nodules • Varies from being red to violaceous • Most often found on the trunk and upper extremities	• Subtle arborising vessels, salmon-coloured background and white areas or circles[7]

In breast cancer, the most common sites of cutaneous metastasis are the chest, abdomen and scalp. Less common sites include the neck, back and upper extremities.[1,6,9] The presence of cutaneous breast cancer metastases is often suggestive of a poor prognosis for the patient going forward; identification of these skin lesions is often associated with a mean survival of only three months.[9]

Breast cancer has the widest range of clinical appearance in terms of cutaneous metastases. The specific patterns are described in Table 2.[1,10,11]

QUESTION 5

How should this patient be managed?

ANSWER 5

As with all patients with metastatic malignancy, patients who develop cutaneous metastases are ideally managed in a multidisciplinary team environment. This would typically include an oncologist, dermatologist, plastic surgeon, radiation oncologist and other specialists as appropriate. The team would aim to also closely liaise with the patient's general practitioner given the associated poor prognosis.[1,6,9] In this case, the patient is currently undergoing second-line systemic therapies. She is aware that cutaneous metastases have a guarded long-term prognosis.

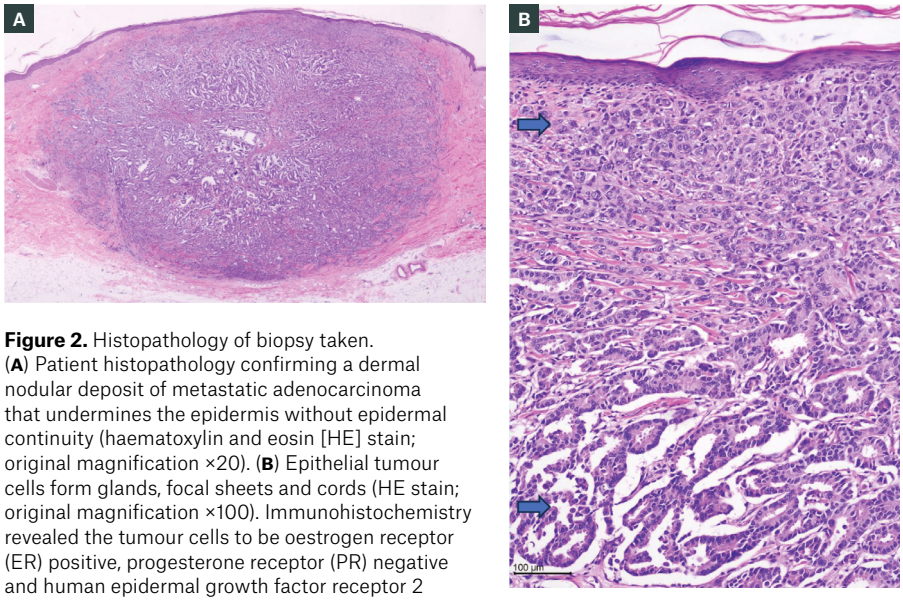

Figure 2. Histopathology of biopsy taken. (**A**) Patient histopathology confirming a dermal nodular deposit of metastatic adenocarcinoma that undermines the epidermis without epidermal continuity (haematoxylin and eosin [HE] stain; original magnification ×20). (**B**) Epithelial tumour cells form glands, focal sheets and cords (HE stain; original magnification ×100). Immunohistochemistry revealed the tumour cells to be oestrogen receptor (ER) positive, progesterone receptor (PR) negative and human epidermal growth factor receptor 2 (HER2) dual in situ hybridisation non-amplified.

Table 2. Clinical presentation of cutaneous metastases in breast cancer

Type	Clinical description
Dermal or subcutaneous nodules	Nodules can vary from small miliary lesions to large tumours
Carcinoma erysipeloides (inflammatory carcinoma)	Sharply demarcated erythematous patch due to local spread of primary cancer blocking lymphatic blood vessels in adjacent skin
Carcinoma en cuirasse	Indurated fibrous scar-like plaques with peau d'orange (orange peel) appearance due to infiltrating tumour cells
Carcinoma telangiectodes	Red–violet papules with numerous blood or lymphatic vessels
Paget disease	Patches resembling dermatitis that extend from the nipple and areola
Alopecia neoplastica	Nodules or plaques on scalp associated with alopecia

Key points

- Cutaneous metastases should be considered as a differential diagnosis in patients with a known history of malignancy when new skin lesions with atypical features appear.
- Cutaneous metastases might be the first presenting sign of unrecognised advanced internal malignancy.
- Cutaneous metastases can be associated with significant distress because they might represent a visible sign of disease progression.

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